

ABSTRACT OF THE DISCLOSURE

A method for reducing dark current within an image sensor includes applying, at a first time period, a first set of voltages to the phases of gate electrodes of vertical shift registers sufficient to accumulate holes of the vertical shift register, beneath each gate electrode and applying, at a second time period, a second voltage to a first set of the gate electrodes while simultaneously applying a more positive voltage to a second set of gate electrodes, the second voltage being of sufficient potential so holes that were accumulated beneath the second set of gate electrodes during the first time are collected and stored beneath the first set of gate electrodes during the second time period. Moreover, the method applies, at a third time period, a third voltage to the second set of gate electrodes while simultaneously applying a more positive voltage to the first set of gate electrodes, such that the previously accumulated holes beneath the first set of gate electrodes are transferred beneath the second set of gate electrodes; and returns the first and second sets of gate electrode voltages to their levels at the first time period.